

PHASE I BOOK EXPLOITATION

1103

Dzugutov, Mikhail Yakovlevich

Vnutrenniye razryvy pri obrabotke metallov davleniyem (Formation of Internal Ruptures During Metal Forming) Moscow, Metallurgizdat, 1958. 207 p. 3,800 copies printed.

Ed.: Vasil'yev, D.I.; Ed. of Publishing House: Golyatkina, A.G.;  
Tech. Ed.: Dobyzhinskaya, L.V.

**PURPOSE:** This book is intended for process engineers and for plant laboratory workers engaged in metal forming and in the development of techniques of deforming low-plastic high-strength steels and alloys. It can also be useful to students of metallurgical vuzes.

**COVERAGE:** The author discusses the causes and nature of the formation of internal ruptures in steel forgings and in structural rolled steel sections in forging and rolling processes, and the means for their elimination. The effect of external friction, of nonuniformity of deformation and of internal (secondary) stresses on the formation of internal defects are discussed. Rational forming processes and

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methods for obtaining metal free from internal defects are presented. The characteristics of internal defects in an initial ingot are given and the behavior of these defects during the forging and rolling processes is described. The following persons are mentioned as having contributed to the theory of plastic deformation: S.I. Gubkin, N.I. Korneyev, I.M. Pavlov, and V.S. Smirnov. There are 25 Soviet references.

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Институт металлургии. Машиностроительный факультет.

Issledovaniya po abarogocheyu splanum, t. 5 (Investigations of Heat-Resistant Alloys, Vol 5) Moscow, Izd-vo AN SSSR, 1955. 423 p. 2-rate slip inserted. 2,000 copies printed.

Editorial Board: V.A. Kilmov, Tech. Ed.; I.P. Rus'ina; Editorial Board: I.P. Bardis, Academician, G.V. Kurtyumov, Academician, N.V. Artyev, Corresponding Member, USSR Academy of Sciences (Resp. Ed.), I.A. Orling, I.M. Pavlov, and I.P. Eshkin, Candidates of Technical Sciences.

**SYNOPSIS:** This book is intended for metallurgical engineers, research workers in metallurgy, and may also be of interest to students of advanced courses in metallurgy.

**NOTES.** This book, consisting of a number of papers, deals with the properties of heat-resisting metals and alloys. Some of the papers is devoted to the study of the structure of heat-resisting alloys, and some to the study of the properties of heat-resisting alloys. The book is written in a clear and concise style, and is suitable for use as a text book or as a reference work. The book is written in Russian, and is published by the Academy of Sciences of the USSR. The book is written in a clear and concise style, and is suitable for use as a text book or as a reference work. The book is written in Russian, and is published by the Academy of Sciences of the USSR.

**Sevitskiy, I.O., and L.V. Ponom.** Study of Certain Problems of the Temperature Dependence of the Plasticity of Steel From the Viewpoint of the Dislocation Theory

Ortiz, P.L., L.V. Pavlinov, A.B. Strizhnik (Deceased), and G.B. Fedorov  
Dislocation in Chromium and Molybdenum

Production-Letter, O.P., M.J. Eschewery, I.S. Kaplan, M.J. Roth, and L.S.

Podarctomys latitarsus, O.S., F. L. Patterson, A. and M. J. Solomonov. Cart Anst.

Stools for Service at Temperatures of 650-1000°C

### Resistant Alloy For Automobile and Stationary Gas Turbines

### UCLA 1.3. The Effect of Elements of Groups IV to VIII on the Properties of Phase II<sub>1</sub>

Kukhryuzh, S.I. The Effect of Hardness and Grain Size on the Thermal Fatigue of Heat-Resistant Steel

Portney, E.I., and O.V. Smirnov. Study of Nitride-Base Materials

Arbuzov, F.A. Study of Phase Composition in the Austenite Layer.

Melemedzi, T.A., K.O. Givshovich, Ya.A. Sil'vt, G.P. Kochharova, M.V. Anisimov, V. Trifunov and A.Ye. Ieffe. Corrosibility of Heat-Resisting Alloys

**Aggarwal, B.J., and A.N. Sathyanarayana.** Metallurgical Problems in Electroless Plating and Micro-Forming-Based Alloyed Metal Matrix Composites. *Metallurgical Engineering Transactions*, 1991, 12, 1, 1-10.

**Welding of Heat-Treating and Alloy Steels and Alloys by Means of Electrodes Resulting in Improved Quality and Workability.** E. J. Medvedev and Yu. V. Leshch.

### Water-Cooled Metal Molds

Property of Nickel-Base Alloys

Chishikoy, S.K., and A.N. Gerasimov, The formation and dissolution of albedo.

Pavlov, I.M. Forming of Hard-to-Form Alloys

# [Declaration] of Certain Allegs

Novik, I. S.; and A. M. Smirnov. Mechanical Properties of Degraded Charcoal. *Thermochim. Acta*, 1967, 13, 1-10.

# Mechanical Aspects of Forming Light-Weighting Polyethylene-Bare and Chromiumase Alloys

DZUGUTOV, M.Ya.; STEPANOV, V.P.

State of stress in cylindrical stock in open-die upsetting  
with flat-face hammers. Kuz.-shtam. proizv. 1 no.8:1-4 Ag '59.  
(MIRA 12:12)

(Forging)



DZUGUTOV, M.Ya.; VAKHTANGOV, B.F.

Occurrence of local overheating and internal defects in  
forging high-alloy steels. Kus.-shtam.proizv. 1 no.11:5-8  
N '59. (MIRA 13:3)

(Forging) (Steel forgings)

DZUGUTOV, M.

Purity of steel. Znan.sila. 34 no.2:5-6 F '59.

(MIRA 12:3)

1. Zamestitel' nachal'nika Tsentral'noy Laboratorii zavoda "Elektro-  
stal'."  
(Steel--Defects)

3

S/182/60/000/002/001/012  
A161/A029

AUTHORS: Dzugutov, M.Ya.; Vakhtanov, B.F.

TITLE: The Effect of Initial Grain Size<sup>16</sup> of 3M4375<sup>18</sup> (EI437B)-Type Alloy on the Final Grain Size After Deformation and Recrystallization 18

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, 1960, No. 2, pp. 1 - 4

TEXT: The alloy mentioned in the title belongs to a monophase metal type with homogeneous solid solution structure without a surplus component. As shown in Figure 1 plotted from tests after full heat treatment, its long-time heat resistance increases with growing grain size and reaches a maximum at a certain size. But this case is observed only when the structure is homogeneous, i.e., without considerable grain size difference in the metal. The effect of initial grain size on the size after forging has not yet been practically stated. Detailed information is given on experiments carried out for this purpose. Seven sets of microphotographs (Figs. 2 - 8) show the initial grain structure before forging ("a"); after deformation by forging to different volume per cent (4, 8, 12, 20, 30, 55 and 80%); and after deformation and recrystallization of specimens. In one experiment series forged specimens were used with uniform grain

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The Effect of Initial Grain Size of 304376 (EI437B)-Type Alloy on the Final Grain Size After Deformation and Recrystallization

size after stabilizing annealing, but different size in different specimens. All specimens were forged with 10, 30 and 70% deformation, heated to 1,080°C in 8 hours to stabilize, and cooled. The obtained mean grain size (Table 2) revealed that the initial grain size had insignificant effect on the final size after 10% deformation; the dependence after higher deformation degrees could not be determined. The following conclusions were drawn: 1) After 10% or less deformation and subsequent recrystallization, the initial structure with non-uniform grain size or with large grain changes considerably but not completely. 2) After 12% and higher deformation and recrystallization, non-uniform or large initial grain size is eliminated practically completely, and the initial structure has no effect on the final structure. 3) If the grain size in the initial structure is not uniform, deformation to no less than 12% is necessary to obtain uniform grain size in forgings and finished machine parts. The chemical composition of the 304376 (EI437B) alloy is not given. There are 8 figures and 2 tables.

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S/182/60/000/003/002/007  
A161/A029

AUTHORS: Dzugutov, M.Ya.; Vinogradov, Yu.V.; Stepanov, V.P.

TITLE: The Effect of the Deformation<sup>1</sup> Degree on the Results of Ultrasound  
Inspection in Forgings From High-Alloy Heat-Resistant Steel and  
Alloys <sup>14</sup> <sub>16</sub> <sup>14</sup>

PERIODICAL: Kuznechno-shtampovoye proizvodstvo, 1960, No. 3, pp. 10 - 13

TEXT: Non-uniform grain size in heat-resistant steel forgings with spots of large-grain structure causes difficulties in ultrasound defectoscopy, i.e., the bottom signal disappears partly or completely in large-grain zones, or false defect pulses are obtained. It was revealed that the forging technology used at the plant gave practically no large-grain zones, but the remaining zones of the initial cast structure caused the same trouble. To determine the effect of summary deformation and of the forging dimensions on the results of ultrasound inspection, an investigation has been undertaken with forgings from alloys 3M4375 (EI437B) and 3M481 (EI481), in cylindrical and washer shape. The forgings were prepared on a 4,000-ton press from an octagonal 2,100 kg ingot. The deformation coefficient is determined at the "Elektrostal" works (there exists no general

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A161/A029

The Effect of the Deformation Degree on the Results of Ultrasound Inspection in Forgings From High-Alloy Heat-Resistant Steel and Alloys

opinion on the determination method of this coefficient) as the relation of the final billet length to the initial length in the drawing operation, or as relation of the initial billet height to the final (or of the final and initial cross section area) in swaging. Explanation is given (in Table 1) how the total deformation coefficient is calculated for the case of alternating drawing and swaging operations. Ultrasound defectoscopes УЗД7Н (UZD7N), 86УМ (86IM), Б47Н (V47I) and others were used, with frequencies of 1.4 - 2.5 megacycles; transformer oil or spindle oil was employed as medium. It was concluded after experiments and comparison of practical production data that the inspection results depend on the deformation degree by forging and on the forging dimensions in the sound direction. As may be seen from Tables 2 and 3, the deformation coefficient 7 or lower did not give a complete ultrasound inspection in forgings of EI481 steel of 155 mm height because of the presence of not recrystallized cast structure, and the same happened with EI437B steel forgings of 215 mm height and 8.16 deformation coefficient, but the coefficient 11 in the first case and 13.3 in the second was sufficient. It was stated that heat treatment of forgings

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The Effect of the Deformation Degree on the Results of Ultrasound Inspection in Forgings From High-Alloy Heat-Resistant Steel and Alloys

with incompletely recrystallized structure and incomplete ultrasound permeability is needed to complete recrystallization. It consists in heating slightly over the temperature of beginning recrystallization soaking in this temperature and cooling. Heating to a higher temperature leads to a more complete and rapid recrystallization process, but can cause the beginning of the collective recrystallization process that could again impair the inspection. Summarizing, the following conclusions are drawn: 1) The total deformation magnitude has a decisive effect, and the accuracy of the results grows with a growing (to a certain limit) deformation coefficient. 2) The inspection accuracy drops with increasing dimensions of forgings in the direction of sound (with equal deformation coefficient). 3) The nature of alloy, or steel, also has an effect. 4) Special heat treatment of forgings that could not be "sounded" at all or partly in the state after forging, usually improves the "soundability" due to more complete recrystallization. There are 2 photographs and 6 tables.

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S/182/60/000/004/003/007  
A161/A029

1.1460 also 1413, 1454

AUTHORS: Dzugutov, M.Ya., Vakhtanov, B.F. 18

TITLE: The Effect of Holding Time at Forging Temperature on the Plasticity of the ЭИ437В (EI437B) Alloy 26

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, 1960, No. 4, pp. 17-19

TEXT: It was observed in the forging shop that deformability of some austenitic high-alloy steel grades and of high-speed steel improved with holding at forging temperature for a longer time than necessary for heating ingots evenly to the center. On the other side, grain growth of deformed structure is believed to affect the plasticity of some alloys at high temperature. The described investigation has been carried out to determine the effect of long holding at forging temperature on the plasticity and strength of cast and deformed test specimens of ЭИ437В (EI437B) alloy (the composition of which is not given). The effect of 2, 10 and 50 hours holding at 900, 1,050 and 1,200°C was studied. An electric furnace was used for heating. The following results were obtained: 1) Holding at 900°C considerably raised the plasticity of cast metal; a uniform increase of all plastic characteristics took place in up to 10 hours holding. Elongation

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The Effect of Holding Time at Forging Temperature on the Plasticity of the  
M437B (EI437B) Alloy

increased by 50 %, reduction in area by 40 %, and impact resistance by 20 % (Fig. 1). During further holding the increase in the plasticity characteristics was considerably slower. Ultimate strength dropped in cast specimens in holding at 900°C faster in the first 2 hours (16 %) and slower afterwards. In deformed specimens holding in 900°C also raised the plasticity, but less so than in cast specimens: after 2 hours holding reduction in area rose by 7 %, and impact resistance by 20 %, elongation dropped slightly but increased in further holding (Fig. 2). Ultimate strength dropped by 17 % in 2 hours and slower in further holding. 2) Preliminary holding of cast specimens at 1,050°C raised the plasticity: after 2 hours elongation increased by 66 %, reduction in area by 43 % (Fig. 3); impact resistance increased insignificantly during 2 hours, and by 15% after 10 hours. Reduction of area and elongation increased only slightly after 2 hours; ultimate strength remained practically constant. In deformed specimens all the properties practically did not change; elongation slightly increased after 2 hours, dropped abruptly in 10 hours holding, and rose again to the initial level in 50 hours (Fig. 4). 3) Holding in 1,200°C improved the plas-

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A161/A029

The Effect of Holding Time at Forging Temperature on the Plasticity of the  
ЭИ437В (EI437B) Alloy

ticity of cast specimens: reduction of area rose by 20 %, elongation by 5 %, and impact resistance by 12 % (Fig. 5). In further holding, impact resistance rose markedly, reduction of area remained constant, elongation slightly dropped in 10 hours and did not change afterwards; ultimate strength remained constant. In deformed specimens, holding for 2 hours at 1,200°C changed the properties only little impact resistance increased slightly (Fig. 6). 4) Holding at high temperature was accompanied with grain growth in deformed metal (Table p. 19). There was no growth at 900°C, it started with 1,050°C and continued for 10 hours. Longer holding had practically no effect. The experimental data proved correct in practical shop forging. The conclusion is drawn that holding for 2 hours at 900-1,200°C considerably improves the plasticity of the cast structure of EI437B alloy, and that holding at 1,050-1,200°C accompanied with grain growth of deformed structure practically does not impair it. Ye. P. Burduchkina took part in the work. There are 6 figures. ✓

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8606L

18 7500 1146, 1416, 1418 S/180/60/000/005/005/033  
 E111/E135  
 AUTHORS: Bychkova, Z.S., Vinogradov, Yu.V., Danil'chenko, A.N.,  
 Dzugutov, M.Ya., Mezis, V.Ya., Rastegayev, M.V., and  
 Stepanov, V.P. (Moscow)  
 TITLE: Investigation of the Recrystallization of Cast  
 Nickel-Based Heat Resisting Alloy  
 PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh  
 nauk, Metallurgiya i toplivo, 1960, No. 5, pp.70-78  
 TEXT: The authors describe their investigation of the  
 difficultly deformable nickel-based alloy "5" (B, without giving its  
 composition). The object of the work was to study conditions for  
 its hot deformation, with special reference to recrystallization.  
 The microstructure of the cast alloy is shown in the top left  
 section of Fig. 1, while that after 14% linear compression (as  
 described by Rastegayev, Ref. 1) is shown in the top right.  
 Differences in grain size under different conditions are illus-  
 trated by the lower sections of Fig. 1. For the main  
 investigation the authors used a production ingot of the alloy to  
 make blanks (somewhat larger than in the original use of linear  
 deformation (Ref. 1) which were deformed at 1100, 1150, 1200 and  
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S/180/60/000/005/005/033  
E111/E135

Investigation of the Recrystallization of Cast Nickel-Based Heat  
Resisting Alloy

1240 °C to 0.5-80%. After air cooling, the deformed specimens were cut vertically into four parts; one of which was annealed at the deformation temperature for 2 hours, another at 1200 °C for 5 hours. Polished sections were made from each. Results are presented as graphs of average grain size against degree of deformation and temperature. Figs 2, 3 and 4 relate, respectively, to deformation without annealing, deformation with annealing at the same temperature, and deformation with annealing at 1200 °C. Complete-recrystallization regions with a sound or defective structure and with welded defects are indicated. Fig. 5 illustrates microstructures of undeformed and deformed specimens. At high degrees of deformation defects formed at lower degrees are welded up. New grains appear and grow at all stages of hot deformation. An investigation was also made of the influence of high-temperature treatment (pressure or heat) on the heat-resisting characteristics. For this, type KPA-3 (KRD-3) circular test pieces were made from discs pressed from the alloy at 1250 °C (cooling to 750-800 °C in 10-12 min., then in air).  
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S/180/60/000/005/005/033  
E111/E135

Investigation of the Recrystallization of Cast Nickel-Based  
Heat Resisting Alloy

Structure was determined without (Table 1) and with (Table 2)  
deformation. Under certain conditions the heat resisting  
properties of the alloy are improved as a result of the  
appearance of serrations at grain boundaries (Fig. 6).  
The work was directed by I.M. Pavlov.  
There are 6 figures, 2 tables and 12 Soviet references.

SUBMITTED: June 1, 1960

Card 3/3

DANIL'CHENKO, A.N.; RASTEGAYEV, M.V.; MEZIS, V.Ya.; DZUGUTOV, M.Ya.; VINOGRADOV,  
Yu.V.

Effect of press forging on the durability and plasticity of alloys.  
Issl. po zharopr. splav. 6:211-222 '60. (MIRA 13:9)  
(Alloys--Metallography) (Deformations (Mechanics))

S/182/61/000/003/001/009  
A161/A133

AUTHORS: Dzugutov, M. Ya., Vakhtanov, B. F.

TITLE: Effect of deformation conditions and the subsequent heat treatment on the properties of the  $\text{Ж437B}$  (EI437B) alloy

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, no. 3, 1961, 3 - 7

TEXT: The effect of the deformation magnitude, temperature during deformation, and subsequent heat treatment has been studied in experiments. The  $\text{Ж437}$  (EI437) type nickel base alloys are very susceptible to hot deformation, and their recrystallization is slow, which results in a metastable structure and residual deformation stresses even after hot-working at maximum temperature. The authors refer to the work of S. T. Kishkin, A. M. Sulima and V. P. Stroganov [Ref. 2: Issledovaniya vliyaniya naklepa na mekhanicheskiye svoystva i strukturu splava  $\text{Ж437A}$  (Investigating the work-hardening effect on the mechanical properties and structure of the EI437A alloy), Oborongiz, 1956], who found that the higher the work hardening degree the more abrupt is the drop of the creep limit. The tests were carried out with forged square templets. Details of the testing technique are given and the obtained data illustrated by graphs. Conclusions: 1) The conditions of de-

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Effect of deformation conditions and the...

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A161/A133

forming and subsequent heat treatment have a considerable effect on the mechanical properties and heat resistance of the EI435B alloy. 2) Optimum and most stable properties and heat resistance are obtained after complete standard heat treatment (1,080°C, 8 hrs, 750°C, 16 hrs). 3) Optimum mechanical and scale-resisting properties at 20°C are obtained with deformation in the 1,000 - 1,100°C range, and maximum heat resistance by deforming at 1,160°C. 4) Semi-hot work hardening produced by deformation at temperatures below 1,100°C without subsequent soaking at 1,080°C results in a lowered long-time heat resistance in 750°C. 5) Shorter soaking at 1,080°C for 2 hrs instead of 8 hrs, not always results in maximum heat resistance of the EI437B alloy at 750°C. It is obvious that 2-hours soaking at 1,080°C is not the best way and does not always ensure a completion of the processes of recrystallization and stabilization of the metal structure. 6) The test results showed that hot mechanical working and subsequent aging at 750°C without soaking at 1,080°C may give nearly same results as full standard heat treatment, but only in the case of the metal deformation ending at temperatures not below 1,100°C. But it is difficult to attain a termination of deformation at such temperatures over the entire forging or blank. [Abstracter's note: The chemical composition of the subject alloy is not given]. The investigations were carried under the supervision of V. S. Kulygin. V. P. Mironova and L. V. Gus'kova took part. There are 9 figures and 3 Soviet-bloc references.

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34519

S/659/61/007/000/006/044  
D217/D303

18.12.50

AUTHORS: Rastegayev, M.V., Danil'chenko, A.N., Dzugutov, M.Ya.,  
Bychkova, Z.S., Mezis, V.Ya., Vinogradov, Yu.V., and  
Stepanov, V.P.

TITLE: Recrystallization of cast, deformation-resistant  
alloys of the nichrome type

SOURCE: Akademiya nauk SSSR. Institut metallurgi. Issledova-  
niya po zharoprochnym splavam, v. 7, 1961, 47 - 57

TEXT: The work was carried out under the supervision of I.M. Pav-  
lova. The recrystallization of nichrome-type alloys has been stu-  
died very little, since their low plasticity in the cast state ma-  
kes experimenting difficult. Therefore, a new method of hot working  
had to be developed, rendering upsetting without rupturing possible.  
This method, in which uniform upsetting is achieved, consists of  
making shallow flat grooves (0.5 - 0.8 mm) with rims of 0.5 mm  
width, in the end faces of a cylindrical specimens (20 mm long and  
20 mm diameter). The grooves are filled with moistened asbestos or

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Recrystallization of cast, ...

S/659/61/007/000/006/044  
D217/D303

water glass, acting as lubricants during high temperature deformation under a drop hammer or press. This enables the contact friction to be decreased to a minimum and thereby permits deformation under conditions of linear compression. The results of investigations of recrystallization processes occurring in metallic alloys on hot working by pressure, are usually presented in the form of space diagrams of recrystallization of the second order within the coordinates "temperature, grain size and degree of deformation". However, these diagrams do not represent the entire recrystallization process which includes the old crystals to a certain extent, as well as any possible intercrystalline failures and their weldability. Therefore, the regions of full and incomplete recrystallization, as well as regions of failure and weldability between the crystals, should be indicated. A nichrome type alloy ingot, made under production conditions, was used in the investigation. Since the maximum transverse diameter of the dendritic crystals of the ingot attains 10 - 13 mm, the dimensions of the specimens were increased to 30 mm diameter and 40 mm length, as against 20 x 20 mm used in the uniform upsetting method. The dimensions of the end fa-

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Recrystallization of cast, ...

S/659/61/007/000/006/044  
D217/D303

ce grooves were increased proportionately to the new specimen dimensions. The specimen axes coincided with the longitudinal direction of the ingot. Three-dimensional recrystallization diagrams were constructed for cast nichrome type alloys by the "uniform" upsetting method, and also for cases in which the soaking time during annealing of the hot deformed metal had to be allowed for. The regions of complete recrystallization of a sound or defective structure, as well as regions of complete recrystallization of structures with welded-in defects were labelled. In all stages of hot deformation of nichrome-type alloys (in the cast or preliminarily recrystallized state) recrystallization (appearance and growth of new grains) was observed to take place. It was found that under certain conditions of hot working and appropriate cooling of forgings, a complex intercrystalline cohesion structure could be obtained in nichrome-type alloys which effectively increased their high temperature resistance. There are 6 figures, 3 tables and 12 Soviet-bloc references.

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(1)

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I003/I203

12 000

**AUTHORS.** Pavlov, I. M., Danil'chenko, A. N., Rastegayev, M. V., Mezis, B. Ya., Dzugutov, M. Ya. and Vinogradov, Yu. V.

**TITLE:** The influence of plastic deformation during rolling on the time to failure, and on the mechanical properties of heat-resisting alloys

**SOURCE.** Akademiya nauk SSSR. Institut metallurgii. Issledovaniya po zharoprochnym splavam v. 9. 1962. Materialy Nauchnoy sessii po zharoprochnym splavam (1961 g.), 108-13

**TEXT.** In an article published in vol. 6 of this series, the same authors (except Pavlov) concluded that the above influence should be investigated for every heat-resisting alloy individually. In the present article, a non-defined alloy designated as "Alloy B" usually used for flat forgings was investigated. As a criterion of its heat-resistance the time was taken to failure at 800°C, and its plasticity was evaluated from its shock resistance at 800°C, and at room temperature. It was concluded that the time to failure of this alloy and its mechanical properties can be increased by plastic deformation with subsequent heat-treatment. This increase is probably due to the close-packed lattice of the acicular strengthening phase. There are 3 figures.

✓

Card 1/1

DZUGUTOV, M. YA.

(40)

PHASE I BOOK EXPLOITATION

SOV/6044

Rokotyan, Ye. S., Doctor of Technical Sciences, Ed.

Prokatnoye proizvodstvo; spravochnik (Rolling Industry; Handbook)  
V. 2. Moscow, Metallurgizdat, 1962. 685 p. 8500 copies  
printed.

Authors: P. A. Aleksandrov, Doctor of Technical Sciences;  
V. P. Anisiforov, Candidate of Technical Sciences; V. I. Bayrakov,  
Candidate of Technical Sciences; M. V. Barbarich, Candidate  
of Technical Sciences; B. P. Bakhtinov, Candidate of Technical  
Sciences [deceased]; B. A. Bryukhanenko, Candidate of Economic  
Sciences; M. V. Vasil'chikov, Candidate of Technical Sciences;  
A. I. Vitkin, Doctor of Technical Sciences; S. P. Granovskiy,  
Candidate of Technical Sciences; P. I. Grudev, Candidate of  
Technical Sciences; I. V. Gunin, Engineer; M. Ya. Dzugutov,  
Candidate of Technical Sciences; V. G. Drozd, Candidate of  
Technical Sciences; N. F. Yermolayev, Engineer; G. M. Katsnel'son,  
Candidate of Technical Sciences; M. V. Kovynev, Engineer;  
M. Ye. Kugayenko, Engineer; M. V. Litovchenko, Candidate of  
Technical Sciences; Yu. M. Matveyev, Candidate of Technical  
Sciences.

Card 1/14

Rolling Industry; Handbook

SOV/6044

Sciences; V. I. Meleshko, Candidate of Technical Sciences; N. V. Mekhov, Engineer; A. K. Rinburg, Candidate of Technical Sciences; V. D. Nosov, Engineer; B. I. Panchenko, Engineer; O. A. Plyatskovskiy, Candidate of Technical Sciences; I. S. Pobedin, Candidate of Technical Sciences; I. A. Priymak, Professor, Doctor of Technical Sciences [deceased]; A. A. Protasov, Engineer; M. M. Saf'yan, Candidate of Technical Sciences; N. M. Fedosov, Professor; S. N. Filipov, Engineer [deceased]; I. N. Filippov, Candidate of Technical Sciences; I. A. Fomichev, Doctor of Technical Sciences; M. Yu. Shifrin, Candidate of Technical Sciences; E. R. Shor, Candidate of Technical Sciences; M. M. Shternov, Candidate of Technical Sciences; M. V. Shuralev, Engineer; I. A. Yulhvetz, Candidate of Technical Sciences; Eds. of Publishing House: V. M. Gorobinchenko, R. M. Golubchik, and V. A. Rymov; Tech. Ed.: L. V. Dobushinskaya.

PURPOSE: This handbook is intended for engineering personnel of metallurgical and machine-building plants, scientific research

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Rolling Industry; Handbook

50V/6044

institutes, and planning and design organizations. It may also be used by students at schools of higher education.

COVERACE: Volume 2 of the handbook reviews problems connected with the preparation of metal for rolling, the quality and quality control of rolled products, and designs of roll passes in merchant mills. The following topics are discussed: processes of manufacturing nonfinished and finished rolled products (the rolling of blooms, billets, shapes, beams, rails, strips, wire, plates, sheets, and the drawing of steel wire), hot-dipped tin plates, lacquered plates, floor plates, tubes made by different methods, and special types of rolled products. Problems of the organization of rolling operations are reviewed, and types of rolled products manufactured in the USSR are shown. No personalities are mentioned. There are no references.

TABLE OF CONTENTS: [Abridged]:

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Rolling Industry; Handbook

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Ch. 32. Initial Material of the Rolling Industry (M. Ya. Dzugutov)	9
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34421  
S/182/62/000/003/002/006  
D040/D113

1.1400

AUTHORS: Dzugutov, M. Ya., and Vinogradov, Yu.V.

TITLE: Application and forging of large ingots of R18 steel

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, no. 3, 1962, 11-14

TEXT: An attempt was made to reduce the carbide heterogeneity in P-18 (R-18) high-speed steel, as this affects the strength of the cutting edge of tools. As the only known way of achieving this consists in increasing the plastic deformation ratio applied to the cast metal, large ingots weighing 500, 850, 1200 and 1700 kg were used instead of the conventional 200 kg ingots used for rolling, or the 300 kg ingots used for forging. Details of the heating and forging techniques used for 1200 kg ingots with the use of chamber and continuous heating furnaces, a 4000-t press and several drop hammers of different capacity are given. The ingots were annealed before the experiments to prevent cracking. Calcium and cerium additions were used for deoxidizing part of the metal, but this had no

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S/182/62/000/003/002/006  
D040/D113

Application and forging ...

effect on the forgeability; the attempt to improve forgeability by using square instead of conventional round ingots failed. Part of the ingots was snagged to 7 mm depth prior to heating, but this resulted only in a slight increase in the yield of good metal. The following conclusions were drawn: (1) Shaped billets forged from 1200 kg ingots have a lower carbide heterogeneity than billets of the same cross section produced from 200-300 kg ingots; however, the heterogeneity is not sufficient to meet the standard requirements per ~~ГОСТ~~ 5952-51 (GOST 5952-51). Besides, the use of 1200 kg ingots results in a considerably lower yield of good metal, and lower productivity of forging equipment; (2) forging without snagging 1200 kg ingots results in a 10-15% lower yield of good metal compared to the yield from 200-300 kg ingots, and the productivity of a 7-ton drop forging hammer is reduced 2-3 times compared to the productivity in forging 200-300 kg ingots; (3) The snagging of 1200 kg ingots prior to forging, improves the forgeability, raises the productivity of the hammers, reduces the work required for surface cleaning, but as compared to forging these ingots without

Card 2/3

Application and forging ...

S/182/62/000/003/002/006  
D040/D113

snagging, does not result in an increased yield of good metal. The productivity of the hammer is raised but is still 1.7 to 2 times lower than in forging 300 kg ingots. (4) Any increase in the ingot weight (above 1200 kg) is accompanied by difficulties in cooling, heating and forging. Metal losses are increased, and the productivity of forging equipment decreases. Therefore, it appears inadvisable to forge ingots heavier than 1200 kg. In order to obtain a further reduction in the carbide heterogeneity, means must be found for increasing the forging reduction ratio of billets produced from 1200 kg ingots. T.L.Lizunova and Ye.P. Burduchkina took part in the experiments. There are 2 tables and 3 Soviet references.

✓

Card 3/3

RASTEGAYEV, M.V.; DANIL'CHENKO, A.N.; DZUGUTOV, M.Ya.; BYCHKOVA, Z.S.;  
MEZIS, V.Ya.; VIHOGRADOV, Yu.V.; STEPANOV, V.P.

Recrystallization of cast, hard to deform, nichrome-type alloys.  
Issl. po zharopr. splav. 7:47-57 '61. (MIRA 14:11)  
(Nickel-chromium alloys--Metallography)

DZUGUTOV, M.Ye.; VINOGRADOV, Yu.V.; Prinimali uchastiye: LIZUNOVA, T.L.;  
BUDUCHKINA, Ye.P.

Use of large R18 steel ingots and the technology of their  
forging. Kuz.-shtam. proizvod. 4 no.3:11-14 Mr '62. (MIRA 15:3)  
(Steel ingots) (Forging)

DZUGUTOV, M.Ya.; STEPANOV, V.P.

New method of making disk forgings by the upsetting of ingots.  
Kuz.-shtam.proizv. 4 no.10:10-14 0 '62. (MIRA 15:12)  
(Forging)

S/182/62/000/005/001/007  
D038/D113

AUTHORS: Dzugutov, M. Ya., and Vakhtanov, B.F.

TITLE: Special features of the technology of hot working Cr-Al alloys

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, no. 5, 1962, 1-5

TEXT: The OX17 MO5 (OKh17Yu5), 1X25 MO5 (lKh25Yu5), OX25 MO5 (OKh25Yu5), ЭИ626 (EI626) and ЭИ595 (EI595) high ohmic resistance alloys, used for wire production, embrittle and crack internally under thermal stresses below 200°C. Roughened and cooled 500 kg ingots made from X13 MO4 (Kh13Yu4) alloy did not crack internally during hot deformation since they were cooled in ingot molds and transferred while hot to lined iron boxes with lids. The method of working blanks and ingots made from Cr-Al alloys, and the production of blanks and rod stock is described. Further research should be made on (1) the choice of the optimum ingot size, (2) the replacement of forging by rolling and (3) the improvement of the metal surface quality. There are 4 figures.

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S/133/62/000/006/011/015  
A054/A127

AUTHORS: Stepanov, V. P., Pridantsev, M. V., Dzugutov, M. Ya.

TITLE: Extra-axial nonhomogeneity of 787 (EI787) steel

PERIODICAL: Stal', no. 6, 1962, 544 - 547

TEXT: It is generally accepted that the tendency to spotty liquation decreases upon raising the nickel content of the alloy. However, the investigations of heat resistant alloys with a nickel content - in some cases as high as 30-40% - [3M696 (EI696), 3M787 (EI787)] or produced on a nickel basis [3M435 (EI435), 3M437 (EI437), 3M765 (EI765), etc.] showed that these alloys are not without this defect. As spotty liquation was found to be pronounced in the EI787 grade, tests were made covering the character of spotty liquation, its effect on the plasticity of the steel and the factors which affect the development of this defect. The steel tested had the following composition (in %): C  $\leq$  0.08, Si  $\leq$  0.60, Mn  $\leq$  0.60, S  $\leq$  0.010, P  $\leq$  0.020, W  $\leq$  2.0 - 4.0, Cr 13.0 - 16.0, Ni 33.0 - 37.0, Ti 2.4 - 3.2, Al 0.7 - 1.7, B 0.03. Structural analyses were made on longitudinal and transverse templates, cut from ingots and forgings. It

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Extra-axial nonhomogeneity of...

S/133/62/COC/006/011/015  
A054/A127

was found that spotty liquation developed in zones of increased pickling tendency, containing an excess compound of eutectic character, arranged in the cast or reheated and deformed metal in the form of nets around the micrograins. An increase in the ingot weight and a reduction of the crystallization rate promoted the development of spotty liquation. In ingots weighing 450 kg the number of spots covering 1 dm<sup>2</sup> of the ingot surface amounted to 3, in 2,100-kg ingots to 11. When pouring 50-kg ingots in two different molds (a conventional, cold cast iron mold and a ceramic mold heated to 700°C), at rates of 3 - 5 and 25 - 30 minutes respectively, no spotty liquation was found in the first ingot, whereas it was well-developed in the second. The effect of spotty liquation on the mechanical properties of steel and mainly on its deformability was studied on specimens subjected to the following heat treatment: heating to 1,180°C, holding time 8 hours, heating to 1,050°C, holding time 4 hours, heating to 750°C, holding time 16 hours; (after each heating cycle air-cooling). In the heat-treated specimens spotty liquation did not affect the heat resistance of the ingots, but decreased their strength and ductility at room temperature, mainly in the transverse specimens (in the latter, the ductility decreased by a factor of 2 - 3). This must be put down to the distribution of the eutectic element. The mechanical properties were

Card 2/3

Extra-axial nonhomogeneity of...

S/133/62/000/006/011/015  
A054/A127

tested in transverse specimens at temperatures of 900 - 1,150°C. Up to 1,100°C spotty liquation did not affect the strength and plasticity of the EI787 grade specimens. However, when heated to 1,150°C, the mechanical characteristics (its strength excepted) and ductility of the steel deteriorated considerably. At this temperature, heating and deformation of the metal resulted in cracks in the liquation zones, evidently caused by the melting of the eutectic component. Until now it is not possible to eliminate spotty liquation directly, which in the temperature zones mentioned has no adverse effect on the mechanical properties of the steel. When, however, applying electric arc vacuum remelting and electric slag remelting, moreover semi-continuous casting, the crystallization rate of the metal in the mold can be increased considerably, thus reducing or completely eliminating the formation of spotty liquation. There are 3 figures and 1 table.

Card 3/3

PAVLOV, I.M.; DANIL'CHENKO, A.N.; RASTEGAYEV, M.V.; MEZIS, V.Ya.;  
DZUGUTOV, M.Ya.; VINOGRADOV, Yu.V.

Effect of plastic deformation during rolling on time length before  
rupture and on the mechanical properties of heat-resistant alloys.  
Isal. po zharopr. splav. 9:108-113 '62. (MIRA 16:6)  
(Heat-resistant alloys--Testing)  
(Deformations (Mechanics))

DZUGUTOV, M.Ya.; VAKHTANOV, B.F.

Preventing the formation of internal transverse cracks during  
the forging of ingots of high-alloy steel and alloys. Kuz.-shtam.  
proizv. 5 no.2:7-9 F '63. (MIRA 16:2)  
(Forging) (Thermal stresses)

4800 N. 4th St. West, Treva, Tenn.

"APPROVED FOR RELEASE: 03/13/2001

CIA-RDP86-00513R000411920015-8

AT4-16415

APPROVED FOR RELEASE: 03/13/2001

CIA-RDP86-00513R000411920015-8"

"APPROVED FOR RELEASE: 03/13/2001

CIA-RDP86-00513R000411920015-8

L 13051-35

EWI(m)/ENA(d)/EWP(t)/EWP(b)

A

m

APPROVED FOR RELEASE: 03/13/2001

CIA-RDP86-00513R000411920015-8"



1-1-1

1-1-1

ENCLOSURE

SECRET

SECRET

Card 2-2

ACCESSION NR: AT4033719

S/0000/64/000/000/0334/0345.

AUTHOR: Stepanov, V. P.; Pridantsev, M. V.; Topilin, V. V.; Dzugutov, M. Ya.

TITLE: Effect of inertial stirring of metal during crystallization on development of spotty liquation and ingot structure

SOURCE: USSR. Komissiya po fiziko-khimicheskim osnovam proizvodstva stali. Fizikokhimicheskiye osnovy\* metallurgicheskikh protsessov (Physico-chemical basis of metallurgical processes); sbornik statey. Moscow, Metallurgizdat, 1964, 334-345

TOPIC TAGS: foundry technique, casting technique, heat resistant alloy, mold charge stirring, ingot structure, spotty liquation, mold rotation, inertial stirring

ABSTRACT: Ingots of heat resistant alloys (Cr-Ni or Fe-Cr-Ni base with Ti, Al, B or other elements), weighing 50, 1000 and 2100 kg were cast with the mold charge stirred inertially while the metal crystallized. The shapes of the ingots were round and cylindrical, round with tapers of 8 or 15°, octahedral and triconical, respectively. Stirring was in the form of retrorotary motion of the suspended charged mold, the latter's return travel being 60 to 80° for the heavier ingots and 160 to 180° for the 50 kg pieces. Stirring periods ranged from 20 to 90 min. for the former and 5 to 39 min. for the latter, at frequencies of 8 to 25 agitations per minute. Stirring reduced or eliminated

Card 1/2

ACCESSION NR: AT4033719

spotty liquation and produced a uniform, fine-grained cast structure in the stirring zone. Two cast structure zones with a liquation ring in between occur in an ingot where available facilities do not allow the stirring of the metal immediately after or during the charging of a mold. "N. A. Shirayev, N. D. Orekhov, G. I. Burylichev and L. F. Chernysheva also took part in the work." Orig. art. has: 6 illustrations.

ASSOCIATION: Komissiya po fiziko-khimicheskim osnovam proizvodstva stali  
(Committee on the Physico-Chemical Basis of Steel Production)

SUBMITTED: 18Oct63

DATE ACQ: 16Apr64

ENCL: 00

SUB CODE: MM

NO REF SOV: 004

OTHER: 000

Card 2/2

ACCESSION NR: AP4038396

S/0182/64/000/005/0003/0006

AUTHORS: Vakhtanov, B. F.; Dzugutov, M. Ya.; Okhrimenko, Ya. H.

TITLE: On the deformation magnitude necessary for the recrystallization of difficult to deform alloys

SOURCE: Kuznechno-shtampovochnoye proizvodstvo, no. 5, 1964, 3-6

TOPIC TAGS: alloy steel, deformation, high alloy steel, alloy EI437B, alloy EI696, alloy EI617, alloy EI787, recrystallization, annealing effect, thermal treatment, forging, metal shrinkage, cast structure

ABSTRACT: Experiments were performed to determine: 1) minimum deformation (induced by upset forging) necessary to induce the recrystallization process in difficult-to-deform alloys; 2) the amount of metal shrinkage required for a complete recrystallization in hammer forging of the alloys EI437B, EI696, EI617 and EI787. Because the recrystallization during deformation at optimal temperatures (1100-1160C) was incomplete, this process was followed by thermal treatments which involved annealing at 1080C, air cooling, aging at 750C for 16 hours, and final cooling in air. It was determined that 3-5% of deformation with subsequent thermal treatment was sufficient for the beginning of the recrystallization

Card 1/2

ACCESSION NR: APL038896

process in alloys EI696 and EI787. Specimens removed from variously deformed, forged, square sections of metal were analyzed. The coefficients of section diminution equaled 1.5, 2, 3, 4, and 5. These analyses showed that the deformation in the axial zone (before thermal treatments) began after a two-fold diminution. After a five-fold diminution, the alloys EI437B, EI787 and EI617 still showed remnants of their cast structure. In the case of EI696 a five-fold diminution was sufficient for a complete recrystallization without thermal treatment. The same effect was achieved after a two-fold diminution in alloys EI787 and EI617, and after a three-fold diminution of alloy EI437B if forging was followed by proper thermal treatments. Orig. art. has: 1 table and 3 figures.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 05Jun64

ENCL: 00

SUB CODE: MM

NO REF SOV: 002

OTHER: 000

Card 2/2

"APPROVED FOR RELEASE: 03/13/2001

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APPROVED FOR RELEASE: 03/13/2001

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"APPROVED FOR RELEASE: 03/13/2001

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Card 2/3

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**CIA-RDP86-00513R000411920015-8**

**APPROVED FOR RELEASE: 03/13/2001**

**CIA-RDP86-00513R000411920015-8"**



L 40992-66 EWT(m)/EWP(t)/ETI IJP(c) JD/HW

ACC NR: AP6027289

SOURCE CODE: UR/0133/66/000/008/0713/0716

AUTHOR: Dzugutov, M. Ya.; Stepanov, V. P.; Varlakov, V. P.

ORG: Elektrostal' Plant (Zavod "Elektrostal'")

TITLE: Effect of the melting method on the properties, phase composition, and structure of KhN77TYuR alloy

SOURCE: Stal', no. 8, 1966, 713-716

TOPIC TAGS: nickel-chromium-titanium alloy, aluminum containing alloy, nickel-chromium alloy, vacuum melting, electroslag melting / KhN77TYuR alloy

ABSTRACT: The effect of vacuum arc melting and electroslag melting on the chemical and phase composition, structure, and properties of KhN77TYuR heat-resistant, nickel-base alloy has been investigated. Neither vacuum arc nor electroslag melting brought about any significant changes in the content of alloying elements, impurities, or gases, except for lead and zinc, whose respective contents, 0.00011 and 0.0027%, in the vacuum-arc melted metal were considerably lower than those in conventionally melted (open atmosphere arc furnace) and electroslag melted metals, 0.00037—0.00039% and 0.0048—0.0047%. The melting method was found to have no significant effect on the structure and grain size of alloy or on the rate of grain growth in alloy cold-rolled with reductions of 5—25% and then annealed at 800—1200C. A considerable

Card 1/2

UDC: 669.187.26:669.187.2.083.4:621.365.2

L 40992-66

ACC NR: AP6027289

grain growth was observed at temperatures above 1000C, regardless of the melting method. The most significant effect of the melting method was observed in the response to aging. In the vacuum-arc and electroslog melted alloy the lattice parameter of the solid solution reaches a minimum and the content of precipitated  $\gamma'$ -phase reaches a maximum (in 50-hr aging) at 750C, compared to 800C for conventionally melted alloy. No significant difference in mechanical properties was observed except for a somewhat higher strength and ductility in the vacuum-arc melted metal. The respective rupture life at 750C under a stress of 30 kg/mm<sup>2</sup> was 172-210, 188-260, and 195-237 for conventionally, vacuum-arc, and electroslog melted alloy. It is noted that vacuum-arc melted alloy is somewhat more susceptible to overheating than conventionally melted or electroslog melted alloy. Orig. art. has: 4 figures and 3 tables. [DV]

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 003/ ATD PRESS: 5058  
ETC/ 6FSTC SET AREA

Card 2/2 11b

L 09139-67 EWT(m)/EWP(w)/EWP(t)/ETI/EWP(k) IJP(c) JD/HW

ACC NR: AP6027294

SOURCE CODE: UR/0133/66/000/008/0735/0738

AUTHOR: Doronin, V. M.; Stepanov, V. P.; Dzugutov, M. Ya. 28

ORG: "Elektrostal'" Plant (Zavod "Elektrostal'")

TITLE: Softening heat treatment of large forgings made from martensite steel

SOURCE: Stal', no. 8, 1966, 735-738

TOPIC TAGS: martensite steel, metal heat treatment, steel forging

ABSTRACT: EI961, EP65 and other types of high temperature steel characterized by high austenite stability are not suited to continuous retarded cooling after forging. This is explained by the fact that continuous retarded cooling after forging does not ensure the elimination of cracks in large forgings. A successive softening heat treatment process was developed at the "Elektrostal'" Plant which completely eliminates such defects in crack sensitive steel. This new heat treatment process was tested under industrial conditions and proved to be highly reliable. The process can be recommended for grades of steel of this type provided that the necessary corrections are considered such as the stability of supercooled austenite, crack sensitivity of the given steel, forging dimensions, shrinkage and the particular design of furnace equipment. Orig. art. has: 3 figures, 1 table.

SUB CODE: 11/ SUBM DATE: None/ ORIG REF: 004/ OTH REF: 001

Card 1/1 nat

UDC: 669.14.018.45

1. 0240-57 ACC NR: AP6027298 SOURCE CODE: UR/0133/66/000/008/0748/0751 (5)  
 AUTHOR: Svistunova, T. V.; Doronin, V. M.; Kruzhkov, V. I.; Topilin, V. V.; Dzugutov, M. Ya.; Vinogradov, Yu. V.; Chermenskaya, N. F.; Kordonov, B. A.  
 ORG: "Elektrostal'" Plant (Zavod "Elektrostal'"); TsNIICHM  
 TITLE: Corrosion resistant nickel-based alloys  
 SOURCE: Stal', no. 8, 1966, 748-751  
 TOPIC TAGS: corrosion resistant alloy, intergranular corrosion, nickel base alloy, fatigue strength  
 ABSTRACT: The authors study and compare corrosion resistance of various types of nickel-based alloys. The welded joints of these alloys are subject to intercrystalline corrosion in aggressive media. Methods are discussed for eliminating this phenomenon. Among these methods are heat treatment of the welded joints, reduction of carbon and iron content in the alloys and the introduction of carbide-forming elements. It was found that intercrystalline corrosion could be eliminated by alloying N7CM27 alloy with 1.4-1.7% vanadium. This eliminates intercrystalline corrosion in welded joints up to 6 mm thick without requiring heat treatment. The new alloy is designated EP496. It was also found that intercrystalline corrosion could be eliminated in chromium-nickel-molybdenum alloys by reducing their carbon-silicon and iron content. The new  
 Cord 1/2 UDC: 669.14.018.8

L 09250-67

ACC NR: AP6027298

alloy is designated EP567. Both of these new alloys have a fatigue limit of 5-7 kg/mm<sup>2</sup> at 1200°C which is 3-4 times higher than that of Kh18N9T steel. A new process is developed for melting and pressure working these alloys to satisfactory deformability. EP496 and EP567 alloys are melted in open induction furnaces with 500 and 1000 kg capacity. The ingots are worked on snagging machines until all defects are removed from their surfaces. Both alloys are difficult to machine, nevertheless, they can be roughed with much less difficulty than Kh18N10T steel. Deformation temperatures for both alloys are given. Both of these alloys have excellent corrosion resistance in hydrochloric and sulfuric acids at various temperatures and concentrations. The welded seams of these alloys are not subject to intercrystalline corrosion and therefore can be recommended for welded sheet structures and tubes used in the chemical and petroleum industries. Orig. art. has: 6 figures, 2 tables.

SUB CODE: 11/ SUBM DATE: None/ ORIG REF: 003/ OTH REF: 005

*DZUKAYEV, Z. Ye.*

DZUKAYEV, Z. Ye.

Clinical and X-ray study of external respiration in primary lung carcinoma [with summary in English]. Vest. rent. i rad. 32 no.5: 51-57 S-O '57. (MIRA 11:2)

1. Iz rentgenodiagnosticheskogo otdela (zav. - prof. I.A. Shekhter) Gosudarstvennogo nauchno-issledovatel'skogo instituta rentgenologii i radiologii (dir. - dotsent I.G. Labunova)

(LUNG NEOPLASMS

primary carcinoma, clin. & kymographic correlations in determ. of resp. funct. (Rus))

DZUKAYEV, Z. Ye, Cand Med Sci -- (diss) "Clinical X-ray Study of  
of external respiration of patients with incipient cancer of the  
lung before and after treatment." Mos, 1958, 16 pp (State Sci Res  
X-ray radiology Inst of Min of Health RSFSR) 150 copies  
(FL, 27-58, 116)

- 197 -

DZUKAYEV, Z.Ye. (Moskva, Sadovo-Spasskaya, d. 19, kv. 39)

Respiration in pulmonary cancer following pneumonectomy and radiation therapy; clinico-roentgenological investigations [with summary in English]. Vop.onk. 4 no.6:683-391 '58. (MIRA 12:1)

1. Iz rentgenodiagnositcheskogo otdela (zav. - prof. I.Z. Shekhter) Gosudarstvennogo nauchno-issledovatel'skogo instituta rentgenologii i radiologii (dir. - dots. I.G. Lagunova).  
(LUNG NEOPLASMS, therapy,

pneumonectomy & x-ray ther., aff. on resp. (Rus))



DZUKOVSKIY, M. A.

DZUKOVSKIY, M. A. - "Change of Functions of the Reticulo-Endothelium, as an Indicator of the Reactivity of Children Suffering from Scarlet Fever, Under Various Hospitalization Systems." Sub 6 Feb 52, Acad Med Sci USSR. (Dissertation for the Degree of Candidate in Medical Sciences).

SO: Vechernaya Moskva January-December 1952

DZUKOVSKIY, Ya. M. (Prof.); POVORODZENKO, V. V. (Prof.)

"Ravnomernost' Gruzovoi i Poezdnoi Raboty Dorogi," (Equality of Loading and Passenger Work of the Railway), 104 p., State Railway Trans. Publ., Moscow 1950.

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and nonresistant to streptomycin, were isolated. The ratio  
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cally active i-hapten from the resistant strain ppt. at a  
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(CHOLESTEROL, in cerebrospinal fluid,  
in neurosyphilis, determ.)

(CEREBROSPINAL FLUID,  
cholesterol, in neurosyphilis, determ.)

(NEUROSYPHILIS, cerebrospinal fluid in,  
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(BLOOD PROTEINS,  
determ. of phosphatides, salting-out method)

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Kierownik sekcji Biochemicznej, mgr. J. Dzulyńska.

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(BLOOD PROTEINS, in various dis.

late syphilis, phosphatide determ. (Pol))  
(PHOSPHOLIPIDS, in blood.

in protein fractions in late syphilis (Pol))

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POLAND

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